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ABSTRACT

This study investigated whether the number of oral reading miscues differs for reflective and impulsive children, whether the proportion of miscues that are semantically appropriate, syntactically appropriate, or graphically similar differ for the two groups, and whether the two groups differ in their self-correction behavior as it relates to these three cue sources. The subjects were 79 children in four first grade classes. The Matching Familiar Figures Test was administered and scored by determining the average time to the first selection of a response and the total number of errors. Each child whose average response time was above the group median and whose number of errors was below the group median was classified as reflective. Each child whose average response time was below the group median and whose number of errors was above the group median was termed impulsive. The results indicated that the reflective children made fewer miscues that differed from the text and fewer miscues of the most numerous category, word recognition. The reflective children self-corrected a greater proportion of their word-substitution miscues, specifically when their miscues were semantically inappropriate to the text and when they were syntactically inappropriate to the following portion of the sentence. (WR)

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AN ANALYSIS OF ORAL READING BEHAVIOR OF REFLECTIVE AND IMPULSIVE BEGINNING READERS

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Examples of oral reading miscues:

Johnny was happy with his birthday (present) gift.
Jchnny was happy with his birthday (goat) gift.
Johnny was happy with his (brother) birthday gift.

Categories of miscues:

1. Word substitution -- The child substitutes a different word in place of a text word.

2. Phrase substitution -- Either the child's substitution or the text includes more than one word.

3. Nonsense substitution -- The child substitutes a nonsense word or part of a word is substituted in place of a text word.

4. Habitual substitution -- The child repeats a substitution he has previously made when he encounters the same word again in the text.

5. Insertion -- One or more additional words are inserted between two words.

6. Omission -- One or more of the text words is omitted.

7. Unknown word -- The child omits a word and says that he does not know it.

8. Repetition -- Either a word in the printed text or a word substitution miscue is repeated by the child.

9. Regression -- The child regresses to the beginning of a phrase or sentence and rereads it.

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AN ANALYSIS OF ORAL READING BEHAVIOR OF REFLECTIVE AND IMPULSIVE BEGINNING READERS

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Children appear to have different cognitive tempos which influence their approach to learning tasks and which have implications for a teacher's choice of instructional methods. One procedure for classifying children's cognitive tempos employs the Matching Familiar Figures Test (Kagan, Rosman, Day, & Phillips, 1964.) There are twelve items in this test. Each item includes a line drawing of a familiar object as a standard and six response choices, one of which is exactly like the standard and the remaining five very similar to it. If the child makes his first selection quickly when attempting to choose the matching response and also if he makes several incorrect selections before he determines the correct response he is classified as impulsive. If he deliberates longer before making his first selection and if he makes fewer incorrect selections he is classified as reflective.

One of the abilities which may be influenced by a child's cognitive tempo is his oral reading ability. Kagan (1965) has investigated the relationships between word recognition abilities in oral reading and tendencies toward reflection in second-grade children. Each child read four paragraphs aloud to an examiner who recorded every error and omission that was made by the child as he read orally. Kagan reported, "In general, children classified as impulsive, in contrast to reflective, in the first grade had the highest reading error scores at the end of second grade" (1965, p. 622). Kagan studied several categories of oral reading errors, some categories reflecting the

graphic characteristics of the printed words in comparison to the erroneous responses, and other reflecting the semantic similarity of the printed words and the errors. The error categories were combined in the analyses in such a way that it is not possible to determine the relative degree of graphic and semantic similarity of the erroneous responses to the printed words. Neither did the analyses reflect the relative incidence of self-correction in the different categories of errors. In effect, then, Kagan's study of oral reading errors was quantitative rather than qualitative.

Recently a method of analyzing the qualitative aspects of oral reading errors has been developed. (K. S. Goodman, 1969) In an article contrasting quantitative and qualitative analysis, Yetta Goodman explained:

> Reader's miscues must be evaluated based on the degree to which the miscue disrupts the meaning of the written material. Once the miscue has been produced by the reader, it is then important to assess the effectiveness of the strategies he uses when meaning is disrupted. This qualitative analysis of miscues can enable a teacher to help a reader select appropriate written material. It also provides specific information regarding a reader's strengths and weaknesses which can be used to plan a personalized reading program. (1972, p. 32)

Fluent oral reading depends on the reader's ability to blend information from three cue sources: graphic, syntactic, and semantic, in order to make rapid responses to printed words. By means of a qualitative analysis of oral reading errors, or miscues, it is possible to estimate how much attention a child pays to the graphic cues and how much to semantic and syntactic cues when he is reading orally and to determine the extent to which he self-corrects miscues when they are graphically dissimilar as opposed to miscues that are semantically or syntactically inappropriate. The analysis may suggest whether the teacher needs to direct more of the child's attention to

one or another of these cue sources in order to help him read more accurately.

Oral reading is analyzed qualitatively by categorizing children's miscues as to semantic and syntactic appropriateness and graphic similarity, and as self-corrected or uncorrected. When a child identifies a word correctly, the word he reads is semantically appropriate in the context of the sentence, it is syntactically correct, and it conforms to the print exactly. When the child reads a different word in place of a printed word, the substituted word may be like the printed word in some ways but not in others. For example, in the sentence Johnny was happy with his birthday gift, if the child says present instead of gift his substitution is semantically appropriate since a present is the same thing as a gift, it is syntactically appropriate since both the printed word and the substitution are nouns, but its graphic form is different from the printed word except fot the final t. If the child says goat instead of gift, his substitution is not semantically appropriate but it is syntactically appropriate since it is a noun. The graphic form of this substitution has three things in common with the printed word: its length, the initial g, and the final t. If the child says brother instead of birthday, his substitution is not semantically appropriate but the two words are somewhat similar in graphic form. This substitution is syntactically appropriate if only the preceding portion of the sentence is considered, Johnny was happy with his brother, but it is not syntactically appropriate in the sentence as a whole: Johnny was happy with his brother.gift. The substitution of the word present for gift is considered to be a better miscue qualitatively than substituting goat for gift or brother for birthday since, although the latter two miscues are more graphically similar they do not approximate the meaning represented

in the print. In all of these examples the miscues were uncorrected.

Several investigators have performed qualitative analyses of first-grade children's oral reading miscues to determine differences between high and low achievers. (Clay, 1969; Weber, 1970, Biemiller, 1970) Briefly, the findings have been that high achievers produced a larger proportion of miscues that were graphically similar and that they self-corrected proportionately more than the low achievers. Neither the high nor the low achievers tended to correct the semantically appropriate miscues but the high achievers corrected a greater proportion of the semantically inappropriate miscues.

A child who pays closer attention to graphic cues and who is likely to correct miscues when they are semantically inappropriate would seem to be behaving reflectively according to Kagan's characterization of conceptual tempos. That is, a reflective child pauses to evaluate the quality of his thinking and the accuracy of his conclusions. On the other hand, the child who pays less attention to graphic cues and who is not likely to correct miscues even when they are semantically inappropriate would seem to be behaving impulsively. That is, he has reported the first idea he thought of with minimal consideration of its appropriateness or quality. The present study was designed to investigate whether the number of oral reading miscues differs for reflective and impulsive children, whether the proportion of miscues that are semantically appropriate, syntactically appropriate, or graphically similar differ for the two groups, and whether the two groups differ in their self-correction behavior as it relates to these three cue sources.

METHOD

The subjects who were available for this study were all of the 79 children who attended the four first-grade classes in one elementary school. About fifty percent of the children's fathers were engaged in professional and managerial occupations, forty percent were clerical, protective workers, or skilled and semi-skilled workers, and ten percent were engaged in unskilled labor. The Matching Familiar Figures Test was administered in November, oral reading samples were obtained in January, and Metropolitan Achievement Test scores were available from the school's routine administration in May. There were 72 children for whom all these test scores were obtained.

The Matching Familiar Figures Test was scored by determining the average time to the first selection of a response and the total number of errors across the twelve items. Each child whose average response time was above the median of the groups and whose number of errors was below the median of the group was classified as reflective. Each child whose average response time was below the median of the group and whose number of errors was above the median of the group was classified as impulsive. There were twenty-five children who were classified as reflective and twenty-six who were classified as impulsive.

A sample of each child's oral reading behavior was obtained by asking him to read orally the next story in his reader following the one he was currently studying in his class. Five reflective and five impulsive children read stories from the first reader, twenty reflective and seventeen impulsive children read stories from primers, and four children, all of them impulsive,

read stories from preprimers. (The oral reading sample of one impulsive child who made seventy-eight miscues in his reading of a preprimer story was not included in the oral reading analysis.) The examiner recorded each of the child's miscues, that is, the utterances which differed from a precise word-by-word reading of the printed text, in the first hundred words of the story he read. Each miscue was assigned to one of the following categories and then quantitative and qualitative analyses of the miscues were performed.

1. Word substitution --The child substitutes a different word in place of a text word.

2. Phrase substitution --Either the child's substitution or the text includes more than one word.

3. Nonsense substitution --The child substitutes a nonsense word or part of a word is substituted in place of a text word.

4. Habitual substitution --The child repeats a substitution he has previously made when he encounters the same word again in the text.

5. Insertion --One or more additional words are inserted between two words.

6. Omission --One or more of the text words is omitted.

7. Unknown word --The child omits a word and says that he does now know it.

8. Repetition --Either a word in the printed text or a word substitution miscue is repeated by the child.

9. Regression --The child regresses to the beginning of a phrase or sentence and rereads it.

RESULTS AND DISCUSSION

Number of Miscues

A quantitative comparison of the miscues of the twenty-five reflective and twenty-five impulsive children demonstrated little difference between the two groups in oral reading behavior. In Table 1 it may be seen that the mean over all miscues was 9.64 for reflective children and 10.60 for impulsive children. However, when the miscues were dichotomized as either responses that differed from the text (categories 1 through 7), or responses that were repetitions of words previously read (categories 8 and 9), qualitative differences in oral reading behavior began to emerge. Reflective children made fewer miscues that differed from the text, just as Kagan had observed. Reflective children made more miscues that were repetitions of words previously read. (These two categories of errors were not included in Kagan's study.)

Insert Table 1 about here

Number of self-corrections

Repetitions and regressions are often associated with self-corrections. The fact that the reflective children have made more of these miscues suggests that they may have higher proportions of self-corrections, also. Since most of the miscues that differed from the text were word substitutions, (see Table 2) the analysis of self-corrections, as well as all the subsequent qualitative analyses, were based on this category only. When the word-substitution miscues were dichotomized as self-corrected and uncorrected it

was determined, as shown in Table 3, that the reflective children self-corrected about the same number of errors as the impulsive children, but that the impulsive children left more miscues uncorrected.

Insert Tables 2 and 3 about here

Kagan's concluding remarks in his oral reading study urged teachers of remedial reading and reading readiness programs to help children overcome impulsive tendencies by giving training in reflection. (1965, p. 627) Yet, in his book Understanding Children Kagan referred to reflective children as fearful of error, excessively inhibited, and cautious. He said that the major cause of a reflective attitude is anxiety over making a mistake. He advised teachers to encourage the reflective child to guess when he is not sure and to be less critical of his mistakes (1971, pp. 128-129). It is not clear from Kagan's remarks just what degree of reflective behavior is thought to be desirable and what is undesirable. It might be assumed, for example, that the tendency of the reflective child in the present study to make more repetitions and regressions and to leave fewer words uncorrected may be detrimental to his growth in reading ability: first, because reflective children may sacrifice rate of reading in order to read more accurately; and second, because their self-corrections may not result in any gain in meaning.

Rate of oral reading

In order to investigate the first concern, the children's oral reading rates were computed. A comparison of the mean rates of reading revealed that reflective children read orally as fast as impulsive children in spite of

their additional repetitions, regressions, and self-corrections (reflectives read 51 words per minute, and impulsives read 47 words per minute). To investigate the second concern, the children's self-corrections were studied in relationship to semantic and syntactic appropriateness.

Insert Tables 4 and 5 about here

Semantic and syntactic appropriateness

As shown in Tables 4 and 5, the majority of the word-substitution miscues of both reflective and impulsive children were semantically inappropriate. Neither reflective nor impulsive children corrected many semantically appropriate miscues. When the semantically inappropriate miscues were considered, however, reflectives had self-corrected fifty-one percent, while impulsive children had self-corrected only thirty-four percent. Since so few of the miscues were semantically appropriate (only 16 for reflectives and 14 for impulsives), the subsequent analyses were based on the semantically inappropriate errors only.

Insert Tables 6 and 7 about here

Tables 6 and 7 illustrate the fact that the relative use of syntactic cues was similar for the reflective and impulsive children. Most of their word substitution miscues were either syntactically appropriate to the whole sentence in which they occurred or were syntactically appropriate to the preceding, but not the following, portion of the sentence. Neither reflective nor impulsive children corrected very many miscues that were syntactically appropriate in the whole sentence, but reflective children were more

likely than impulsive children to correct miscues that were syntactically inappropriate to the following portion of the sentence. There were very few word substitution miscues that were syntactically inappropriate to the whole sentence (only 10 for reflectives and 19 for impulsives) but proportionately more of these were corrected by reflective children than by impulsive children.

In summary, the reflective children made fewer miscues that differed from the text, and in particular fewer miscues of the most numerous category, word substitutions. The reflective children self-corrected a greater proportion of their word-substitution miscues, specifically when their miscues were semantically inappropriate to the text and when they were syntactically inappropriate to the following portion of the sentence. Thus reflective children appear to be self-correcting their miscues in order to reflect the meaning of the text more accurately.

Silent reading comprehension

Although it is apparent that impulsive children are not self-correcting as many semantically and syntactically appropriate miscues overtly in oral reading, it is possible that they make these corrections covertly, and thus actually comprehend the meaning as well as the reflective children do without exhibiting the anxiety over their errors that reflective children have been said to exhibit. As one way of investigating whether impulsive children might be gaining as much meaning as reflective children when reading silently, the mean Metropolitan Achievement Test scores of the two groups were compared. The reflective children's mean standard score was higher on each of the four reading subtests, and the difference reached statistical significance

comprehension subtest (see Table 8). Not only do the reflective children appear to be concerned about meaning in their oral reading behavior, but also they appear to be obtaining more meaning when reading silently.

Insert Table 8 about here

Graphic Similarity

The classification of children as reflective or impulsive is based on the Matching Familiar Figures Test which is essentially a visual discrimination test. Thus children who differ on this test would be expected to differ in their use of graphic cues in oral reading. In Table 9 it may be seen that reflective and impulsive children showed little difference in their use of graphic cues overall. For both groups a slight majority of word substitution miscues began with the same letter as the text word. When the miscues were categorized as to graphic similarity and the proportions of self-corrections in each category were determined, differences in the use of graphic cues became apparent. Table 10 shows that the reflective children were more likely than impulsive children to self-correct their graphically dissimilar miscues.

Insert Tables 9 and 10 about here

Sight Vocabulary

In order to determine whether the closer attention to the print as exhibited by reflective children in their self-correction behavior might pay off in the acquisition of sight vocabulary, their word recognition abilities were tested in second-grade by use of the Standard Reading

Inventory word lists.(McCracken, 1966). There were twenty-two each of the reflective and impulsive children for whom the word recognition scores could be obtained. Of the reflective children there were fifty-nine percent who were able to pass word lists above second-grade level while only thirty-two percent of the impulsive children were able to do so.

Limitations

There are at least four important limitations which should be discussed in relationship to the findings in this study. First, in this analysis of oral reading miscues none of the observed differences has been tested for statistical significance because the scores are summed over different subjects reading from a variety of stories. The differences in mean number of miscues do not appear to be large, yet they do suggest a practical significance to reading teachers since it is recommended that children be instructed in reading materials in which they typically make no more than five miscues in one-hundred words. (Which of the categories should be counted as miscues is a persistent controversy among reading experts, however).

Second, since intelligence tests were in disfavor in the school system where this study was conducted it was not possible to ascertain whether the differences in reading abilities that were observed might be related to intelligence as well as to cognitive style.

Third, this oral reading analysis is based on children who were just beginning to learn to read. An example of their inexperience was found in the tendency of both the reflective and the impulsive children to leave miscues uncorrected if the miscues were syntactically appropriate to the whole sentence even when the miscues were semantically inappropriate. It

seemed as if the children had difficulty coordinating all the cue sources at once when making oral reading responses. It may be that children who are in a later stage of learning to read would make miscues that would be qualitatively different from the miscues of these beginners, and that the miscues of more experienced readers would interact differently with tendencies to reflection.

Fourth, a child's position on the reflection-impulsivity continuum is determined with reference to the median scores of the children who took the test with him. The present study was based on children who were predominantly of the middle socioeconomic class, and without more information about the tendencies toward reflection and impulsivity in groups of children representing a wider socioeconomic range it is difficult to judge the strength of the tendencies to reflection exhibited in these children's behavior.

SUMMARY

An index of reflection-impulsivity was administered to first-grade children. Samples of oral reading behavior, Metropolitan Achievement test scores, and Standard Reading Inventory word recognition test scores were obtained. Reflective children made fewer oral reading miscues than impulsive children, and specifically fewer word substitution miscues. Reflective children made more repetitions, regressions, and proportionately more self-corrections than impulsive children. The oral reading rates of the two groups were about the same. The reflective children self-corrected proportionately more word substitutions that were semantically inappropriate and more word substitutions that

were syntactically inappropriate to the following portion of the sentence. Their performance on the Metropolitan Reading Achievement reading subtest was significantly higher. The reflective children self-corrected proportionately more word substitutions that were graphically dissimilar to the text words particularly when the word substitutions were also semantically inappropriate. More reflective children than impulsive children passed word recognition test lists above second grade level when tested in second-grade. In general it appeared that the self-corrections in oral reading behavior of reflective children who are just beginning to learn to read reflect an attempt to obtain meaning, and that reflective children also exhibit better reading comprehension in achievement tests at the end of first-grade and possess more extensive sight vocabularies in the first semester of second grade. Tests of statistical significance of the observed differences in oral reading behavior were not applied because the measures were summed over several children reading several stories. It was not possible to determine the relative influence of intelligence, stage of learning, and socioeconomic characteristics on the reading abilities of the reflective and impulsive children in this study.

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Table 1 Mean number of all miscues

	Reflective	Impulsive
Miscues that repeat the text	4.4	2.8
Miscues that differ from the text	5.2	7.8
All miscues	9.6	10.6

Table 2 Mean number of miscues that differ from the text

	Reflective	Impulsive
Word substitutions	3.2	4.8
All other substitutions, and insertions, omissions and unknown words	2.0	3.0
All miscues that differ from the text	5.2	7.8

Table 3 Mean number of word substitution miscues

	Reflective	Impulsive
Self-corrected	1.5	1.6
Uncorrected	1.7	3.2
All word substitution miscues	3.2	4.8

Table 4 Percent of miscues that are semantically appropriate

	Reflective (number of miscues=81)	Impulsive (number of miscues=120)
Semantically appropriate	20	12
Semantically inappropriate	80	88

Table 5 Percent of self-correction by semantic appropriateness

	Semantically Appropriate		Semantically Inappropriate	
	Reflective	Impulsive	Reflective	Impulsive
Self-corrected	38	29	51	34
Uncorrected	62	71	49	66

Table 6 Percent of semantically inappropriate miscues that are syntactically appropriate and inappropriate

	Reflective (number of miscues is 67)	Impulsive (number of miscues is 106)
Syntactically appropriate to the whole sentence	37	32
Syntactically inappropriate to the following portion of the sentence	52	52
Syntactically inappropriate to the whole sentence	11	16

Table 7 Percent of self-correction of semantically inappropriate miscues by syntactic appropriateness

	Syntactically appropriate to the whole sentence		Syntactically inappropriate to the following portion of the sentence		Syntactically inappropriate to the whole sentence	
	Reflective	Impulsive	Reflective	Impulsive	Reflective	Impulsive
Self-corrected	21	26	74	45	43	12
Uncorrected	79	74	26	55	57	88

Table 8 Mean word substitution miscues in oral reading and Metropolitan Achievement Test standard scores by reader level placement for reflective and impulsive first-graders

	Reader Level Placement in January						All Children	
	Pre-primer		Primer		First-reader			
	Reflective N=0	Impulsive N=3	Reflective N=20	Impulsive N=17	Reflective N=5	Impulsive N=5	Reflective N=25	Impulsive N=25
Word substitutions in oral reading		5.33	3.64	5.41	1.60	2.40	3.24	4.80
Metropolitan Achievement Test								
Word Knowledge		42.3	59.3	56.6	58.0	62.0	59.0	56.0
Word Analysis		40.3	52.9	51.2	58.8	56.6	54.1	50.1
Reading		42.7	62.1	55.4	65.0	61.8	62.7*	55.1*
Total Reading		41.3	58.8	54.8	61.6	62.0	59.4	54.6

* $t=2.61$, $df=48$, $p < 0.02$

Table 9 Percent of semantically inappropriate miscues that are graphically similar and dissimilar

	Reflective	Impulsive
Same initial letter	57	52
Different initial letter	43	48

Table 10 Percent of self-correction of semantically inappropriate miscues by graphic similarity

	Same initial letter		Different initial letter	
	Reflective	Impulsive	Reflective	Impulsive
Self-corrected	41	38	64	31
Uncorrected	59	62	36	69